

CLAIMS

1. A video process in which spatially co-sited information from different temporal samples is recursively combined, wherein the signal is decomposed into a low frequency band and at least two high frequency bands, and both recursive non-linear processing and non-recursive non-linear processing is carried out in each high frequency band.
2. A process according to Claim 1, wherein the non-linear processing comprises a gain dependent on processed signal amplitude.
3. A process according to Claim 2, wherein the non-linear processing comprises an instantaneous gain dependent on processed signal instantaneous amplitude.
4. A process according to any one of the preceding claims, wherein the high frequency bands comprise two dimensional spatial frequency bands.
5. A process according to any one of the preceding claims, wherein the input video signal, a recursive signal and a non-recursive signal are combined to derive separate noise reduced and noise corrected signals; the noise reduced signal being utilised in said recursion and said noise corrected signal being output.

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6. A process according to Claim 5, wherein there is variation between high frequency bands of the relative contributions of the recursive signal, the non-recursive signal and input video signal in the noise reduced signal and wherein there is variation between high frequency bands of the relative contributions of the recursive signal, the non-recursive signal and input video signal in the noise corrected signal.
7. A process according to Claim 5 or Claim 6, comprising the further step of deriving a detail corrected signal and outputting a noise and detail corrected signal.
8. A process according to Claim 7, wherein there is variation between high frequency bands of the contribution of the detail corrected signal to the noise and detail corrected signal that is output.
9. A process according to any one of the preceding claims, in which said recursive processing is motion compensated.
10. A video process in which spatially co-sited information from different temporal samples is recursively combined, wherein the combination varies in dependence upon spatial frequency, there being at least three spatial frequency bands, with a different combination in each of the three bands.
11. A process according to Claim 10 in which recursive and non-recursive filtering is combined.
12. A process according to Claim 11 in which one or more non-recursively separated detail components is combined with the video signal.

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13. A process according to Claim 12 in which one or more noise components are removed from one or more non-recursively separated detail components and the resulting noise-reduced detail is combined with the video signal.
14. A process according to any of Claims 10 to 13 in which one or more detail components are separated from a video signal and combined with a noise reduced video signal.
15. A process according to any of Claims 10 to 15, wherein recursively and non-recursively filtered signals are input to non-linear filters for removing specific components of the signals.
16. A process according to Claim 15, wherein it is the noise component of a given signal which is filtered.
17. A process according to any of the Claims 11 to 16, wherein recursively and non-recursively filtered signals are input to band-splitting filters, and sub-bands of the recursively and non-recursively filtered signals are combined.
18. A process according to Claim 17, wherein sub-bands of corresponding frequency from the respective recursively and non-recursively filtered signals are combined.
19. A process according to Claim 17 or Claim 18, wherein the set of sub-bands of the recursively and non-recursively filtered signals are both input to a single array of non-linear filters, the output of which being a signal multiplexed between the filtered recursive signal, and the filtered non-recursive signal.

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20. A process according to any one of Claims 10 to 19 in which the recursive filtering is motion adapted.
21. A process according to any one of Claims 10 to 19 in which the recursive filtering is motion compensated.
22. Video processing apparatus comprising a filter structure serving to divide an input video signal into at least two high frequency bands; at least one recursive loop providing for the recursive combination in each band of spatially co-sited information from different temporal samples; a non-linear processor operating on a non-recursive signal in each band and a combiner serving to generate through parameterised combination of input video signal, recursively combined video signal and non-linearly processed signal, both a noise reduced signal for the or each recursive loop and a noise corrected signal for output.
23. Apparatus according to Claim 22, wherein the parameters of said combination vary as between the spatial frequency bands.
24. Apparatus according to Claim 22 or Claim 23, wherein the combiner serves to generate a detail correction signal and a noise signal, the noise reduced signal being formed by subtraction of the noise signal from the input signal and the noise corrected signal being formed by weighted linear combination of the detail correction signal, the noise signal and the input signal.
25. Apparatus according to Claim 24, wherein the weighting coefficients applied respectively to the detail correction signal, the noise signal and the input signal vary as between the bands.

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26. Apparatus according to any one of Claims 22 to 25, wherein the characteristic of said non-linear processor varies between the bands.
27. Apparatus according to any one of Claims 22 to 26, wherein the recursive combination varies as between bands.
28. Apparatus according to any one of Claims 22 to 27, wherein the non-linear processor serves to pass differentially low amplitude signals expected to contain noise.
29. Apparatus according to any one of Claims 22 to 28, wherein the recursive loop is motion adapted.
30. Apparatus according to any one of Claims 22 to 29, wherein the recursive loop is motion compensated.
31. A video process comprising the steps of dividing an input video signal into at least two high frequency bands; deriving for each band a recursively filtered signal and a non-recursively filtered signal; combining the input video signal, the recursively filtered signal and the non-recursively filtered signal to derive separate noise reduced and noise corrected signals; utilizing the noise reduced signal in said recursive filtering and outputting said noise corrected signal.

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32. A process according to Claim 31, wherein there is variation between frequency bands of at least one of: the recursion constant, the characteristic of the non-recursive filtering input video signal, the relative contributions of the recursively filtered signal, the non-recursively filtered signal and input video signal in the noise reduced signal and the relative contributions of the recursively filtered signal, the non-recursively filtered signal and input video signal in the noise corrected signal.
33. A process according to Claim 31 or Claim 32, comprising the further step of deriving a detail corrected signal and outputting a noise and detail corrected signal.
34. A process according to Claim 33 wherein there is variation between frequency bands of the contribution of the detail corrected signal to the noise and detail corrected signal that is output.